

PATENT

Attorney Docket No. RS150

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

KEVIN WESLING

Serial No. 10/707,136

Filed: November 21, 2003

For: Cable Guide For A Bicycle Suspension Fork

Group Art Unit 3611

Examiner: Lee Sin Yee Lum Vannucci

APPEAL BRIEF

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In regard to the above referenced application, Appellant submits this Appeal Brief.

I. REAL PARTY IN INTEREST

The real party in interest is SRAM Corporation. SRAM Corporation's right to take action in the subject application was established by virtue of an Assignment from the inventors to SRAM Corporation recorded at Reel/Frame 014149/0350.

II. RELATED APPEALS AND INTERFERENCES

The undersigned legal representative of Appellant hereby confirms that there are no known appeals or interferences relating to the present application, or any parent application, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF THE CLAIMS

Claims 1-4 are pending in the application. No claims have been allowed. Claims 1-4 stand rejected under a final office action mailed January 6, 2006. Rejection of each of the claims 1-4 are being appealed.

IV. STATUS OF THE AMENDMENTS

No amendment has been filed subsequent to final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is a cable guide that directs a control cable extending between an actuator, such as a lever located on a handlebar of a bicycle, and a bicycle suspension system. The cable guide is located on a crown of the bicycle suspension system. Claim 1 is an independent claim. None of the claims 1-4 have means plus function or step plus function elements as permitted by 35 USC §112, sixth paragraph. Independent claim 1 recites a cable guide 10 for a control cable 14 extending between an actuator and a suspension system 16 having a crown 12 connecting two parallel tubular bodies 18, 20 to a steerer tube 22 (paragraph [0015], lines 3-5; paragraph [0016], lines 1-2). The cable guide 10 includes a housing 38 integrally formed with the crown 12 (paragraph [0018], lines 1-2). The housing 38 includes a bore 40 extending therethrough for receiving the control cable 14 (paragraph [0018], lines 5-8).

VI. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-4 are obvious under 35 U.S.C. § 103(a) in view of Kuo (US 6,767,024).

VII. ARGUMENT

The examiner bears the burden of establishing a prima facie case of obviousness under 35 USC 103(a). To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations (MPEP 2143).

Claims 1-4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo (US6767024). Kuo fails to teach or suggest all the claimed limitations of the present invention. Claim 1 of the present invention recites a cable guide housing integrally formed with a crown of a bicycle fork. Kuo does not teach or suggest a cable guide housing integrally formed with a crown of a bicycle fork. In an Office Action mailed January 26, 2006, Examiner stated that Kuo disclosed a cable guide housing that includes elements 61, 65 and 651 and in an Advisory Action dated March 22, 2006, Examiner refers back to the Office Action mailed January 26, 2006 and states that the housing comprises a different group of elements adjacent the unidentified crown; 62, 611- 613, B. Examiner further states that Kuo does not explicitly disclose the housing as “integrally formed” with the crown, however, this configuration is disclosed because the housing is rigidly secured with the outer surface of the crown. Appellant respectfully disagrees with Examiner.

In Kuo, none of the elements 61, 65 and 651 are integrally formed with the crown. Likewise, none of the elements 62, 611-613, B are integrally formed with the crown. Instead, a rotatable cap or spool 61 is connected to a base member 62, the base member 62 being

threadably connected to a top of the inner tube 52, not to the crown. Further, the control cable block 651 is attached to the clamp ring 65, the clamp ring 65 being securely mounted to the base member 62, the base member 62 threadably connected to the top of the inner tube 52, finally the inner tube 52 connected to the crown (see specification at col. 2, lines 62-67; col. 3, lines 1-3). Accordingly, none of the elements 61, 65, and especially 651, are connected or rigidly secured to the crown. Additionally, a positioning bolt 611 extends through a center of the cap 61 and is fixed to the base member 62 so that the cap 61 is rotatable relative to control cable block 651 and clamp ring 65, therefore, bolt 611 and cap 61 cannot be integrally formed with these elements 651, 65 or with the crown (see specification at col. 2, lines 64-66). Furthermore, a torsion spring 612 is connected to the underside of the cap 61 and one end of the spring 612 is positioned by a pin 613 extending from a top of the cap 61, the other end of the spring 612 is positioned to the base member 62 by another pin 662 on the base member 62. The torsion spring 612 allows the cap 61 to be rotated when the lever 22 is rotated (see specification at col. 4, lines 17-23). Therefore, the elements 611-613 are also not integrally formed with the clamp ring 65 or the cable block 651. Examiner is collectively pointing to arbitrary elements as comprising the housing simply because they are proximate or adjacent the crown, including the rotatable spool 61 which functionally cannot be integrally formed with the crown.

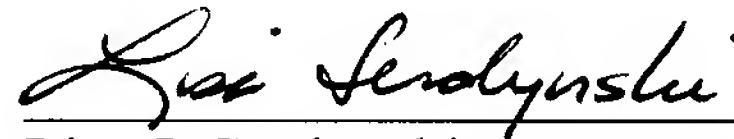
Finally, in the Kuo device, because the clamp ring 65 - to which cable block 651 is connected - is connected to base member 62, which in turn is threaded to the inner tube 52, the resulting orientation of the cable block 651 relative to the crown varies depending on the orientation of the base member 62 which is threadably connected to the inner tube 52. Accordingly, in the Kuo device, the clamp ring 65 must be loosened and rotated to properly align the cable B relative to the spool 61. This problem is avoided in the claimed invention where the cable guide housing is formed integrally with the crown, not with any component of the legs of the suspension system. For these reasons, none of the elements 61, 62, 65, 611-613, B or 651 constitute a housing integrally formed with the crown as recited in claim 1. Therefore, the rejection of claim 1 should be withdrawn.

Regarding claim 4, Examiner stated that the language "forged together" refers to the manner in which the housing and the crown are made, which is patentably immaterial. Applicant respectfully disagrees with Examiner. The limitation "forged together" is used to describe physical characteristics of the product. These words are limitations on the structure of the invention, not words describing how the invention is made. See e.g., *In re Garnero*, 412 F.2d 276, 162 U.S.P.Q. 221 (C.C.P.A. 1969) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting the terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.) Accordingly, the limitation "forged together" is a structural limitation that should be given patentable weight.

VIII. CLOSING REMARKS

For the foregoing reasons, Appellant submits that the rejection of claims 1-4 pursuant to 35 USC §103(a) is improper, and that claims 1-4 are, therefore, patentable. Accordingly, Appellant respectfully requests that the rejections of the Examiner be reversed.

Respectfully Submitted,
KEVIN WESLING


Lisa J. Serdynski, Attorney
Registration No. 40,307
SRAM Corporation
1333 N. Kingsbury, 4th Floor
Chicago, IL 60622
(312) 664-3652

IX. CLAIMS APPENDIX

1. A cable guide for a control cable extending between an actuator and a suspension system having a crown connecting two parallel tubular bodies to a steerer tube, said cable guide comprising: a housing integrally formed with the crown, the housing having a bore extending therethrough for receiving the control cable.
2. The cable guide of claim 1 wherein the suspension system further includes a spool disposed on one end of the tubule bodies for winding and unwinding the control cable, the housing configured such that a portion of the control cable extending between the housing and the spool lies substantially in a plane of the spool.
3. The cable guide of claim 2 wherein the control cable includes an inner wire encased in an outer casing, the housing having a radially extending flange for engaging the outer casing while permitting the inner wire to extend through the bore.
4. The cable guide of claim 1 wherein the housing and the crown are forged together.

X. EVIDENCE APPENDIX

Enclosed please find a copy of the Kuo, United States Patent No. 6,767,024, reference relied upon by Examiner as to the grounds of rejection to be reviewed upon appeal.

XI. RELATED PROCEEDINGS APPENDIX

None



US006767024B1

(12) **United States Patent**
Kuo

(10) **Patent No.:** **US 6,767,024 B1**
(45) **Date of Patent:** **Jul. 27, 2004**

(54) **FRONT SUSPENSION SYSTEM WITH LOCK DEVICE**

(76) Inventor: **Yung-Pin Kuo**, No. 55, Alley 121, Lane 175, Kuo Shen Rd., Chang Hwa City (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/623,700**

(22) Filed: **Jul. 22, 2003**

(51) **Int. Cl.⁷** **B62K 21/00**

(52) **U.S. Cl.** **280/276; 280/275; 74/500.5; 74/502.2; 188/285**

(58) **Field of Search** **280/276, 275, 280/283, 284; 74/500.5, 501.6, 502.2, 519; 188/281, 272, 282.4, 285, 300**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,679,811 A * 7/1987 Shuler 280/284

5,275,264 A * 1/1994 Isella 188/299.1
5,320,375 A * 6/1994 Reeves et al. 280/284
5,909,890 A * 6/1999 Sachs et al. 280/284
6,120,049 A * 9/2000 Gonzalez et al. 280/276
6,217,049 B1 * 4/2001 Becker 280/276
6,382,370 B1 * 5/2002 Girvin 188/299.1
6,631,915 B2 * 10/2003 Barefoot 280/276

* cited by examiner

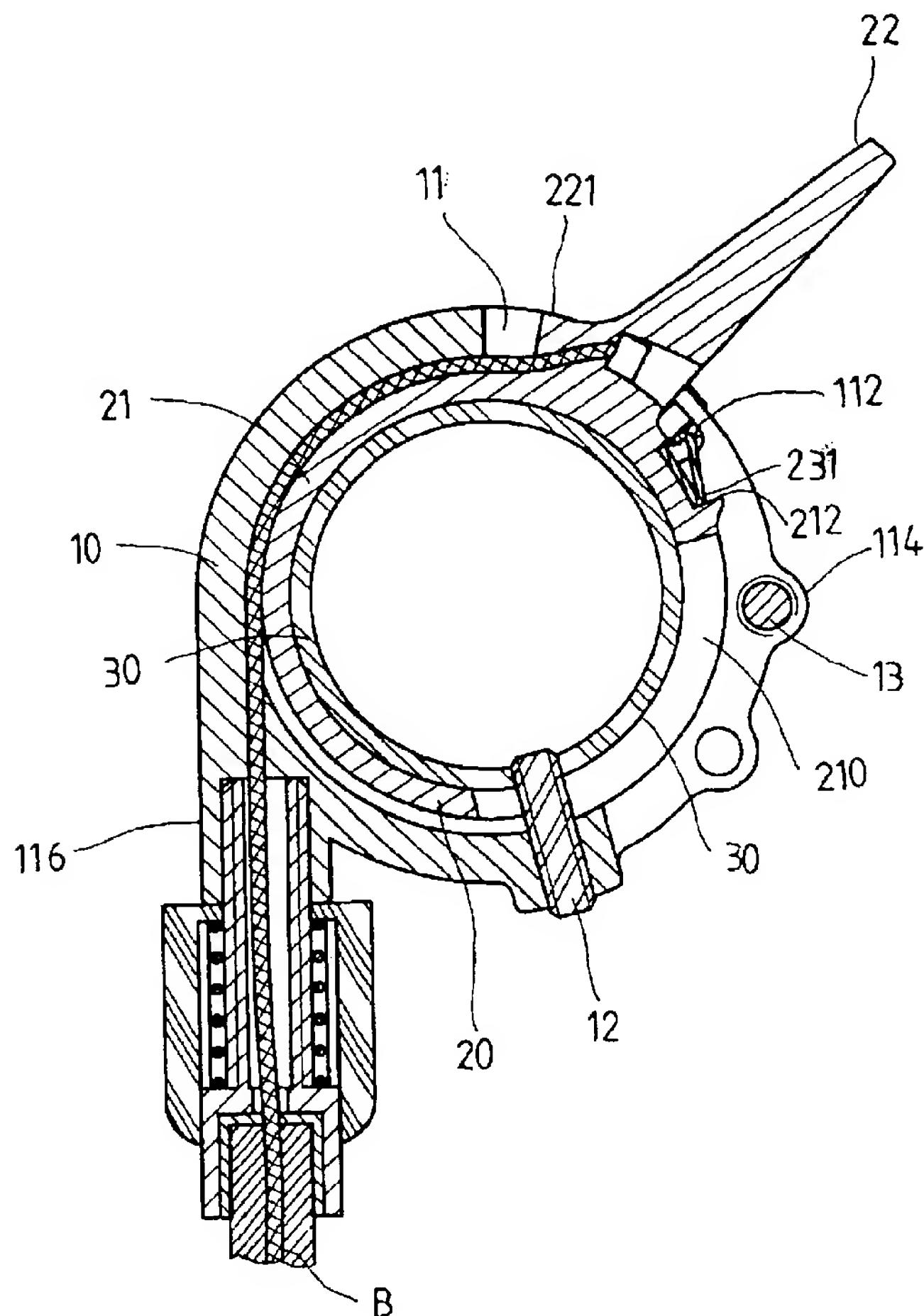
Primary Examiner—Daniel G. DePumpo

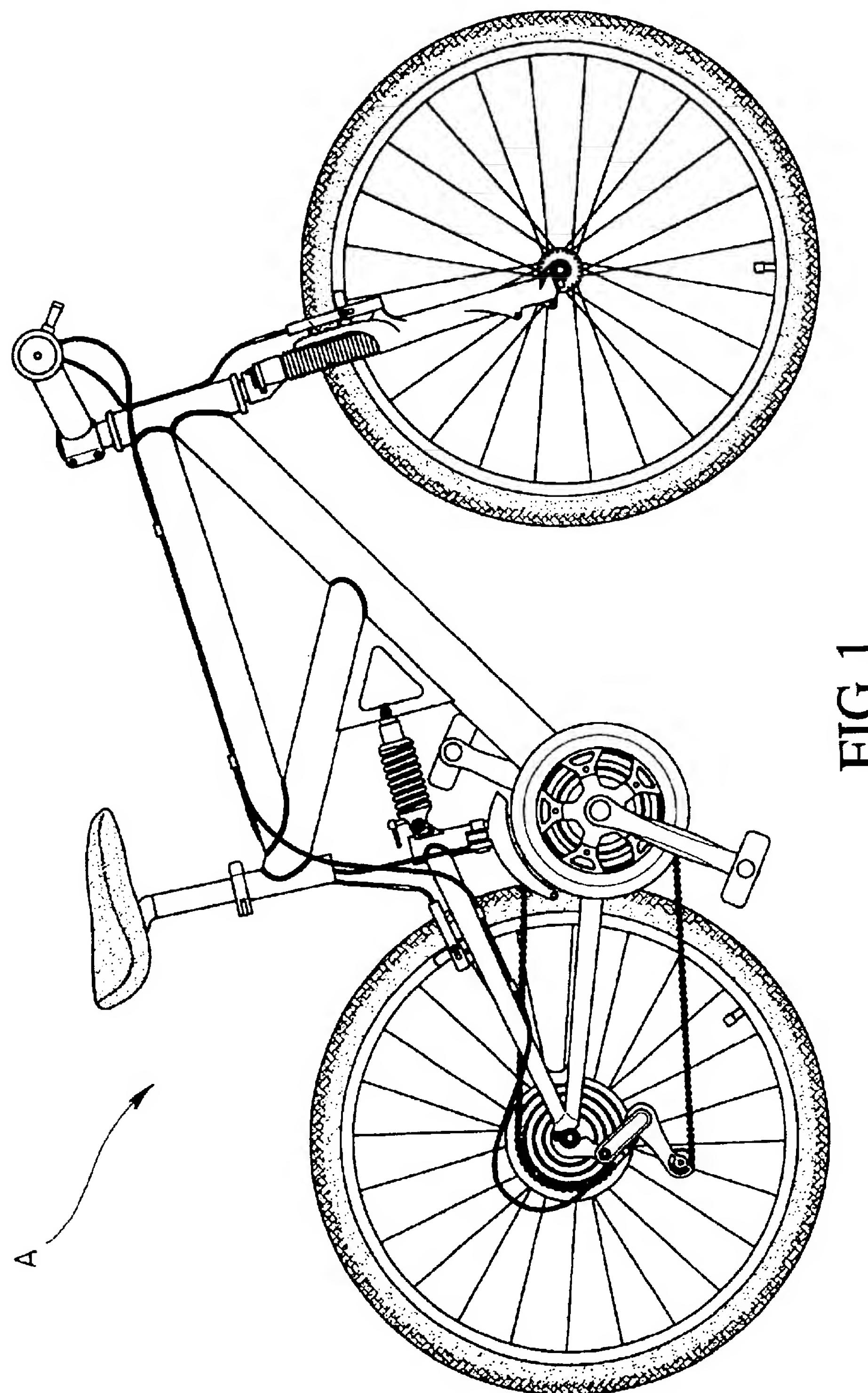
(74) *Attorney, Agent, or Firm*—Rosenberg, Klein & Lee

(57) **ABSTRACT**

A bicycle front suspension system includes two cylinders on the front fork and each cylinder includes an outer tube and an inner tube which is movably received in the outer tube. A cap is rotatably connected to the inner tube and connected to a rod. A control cable is connected between the cap and a lever which is rotatably engaged in a collar on the handlebar of the bicycle. The lever is rotated to operate the control cable so as to rotate the cap and the rod. The rotation of the rod controls the communication between two chambers in the inner tube so that the hydraulic fluid is controlled to make the cylinder to be locked or operative.

6 Claims, 11 Drawing Sheets





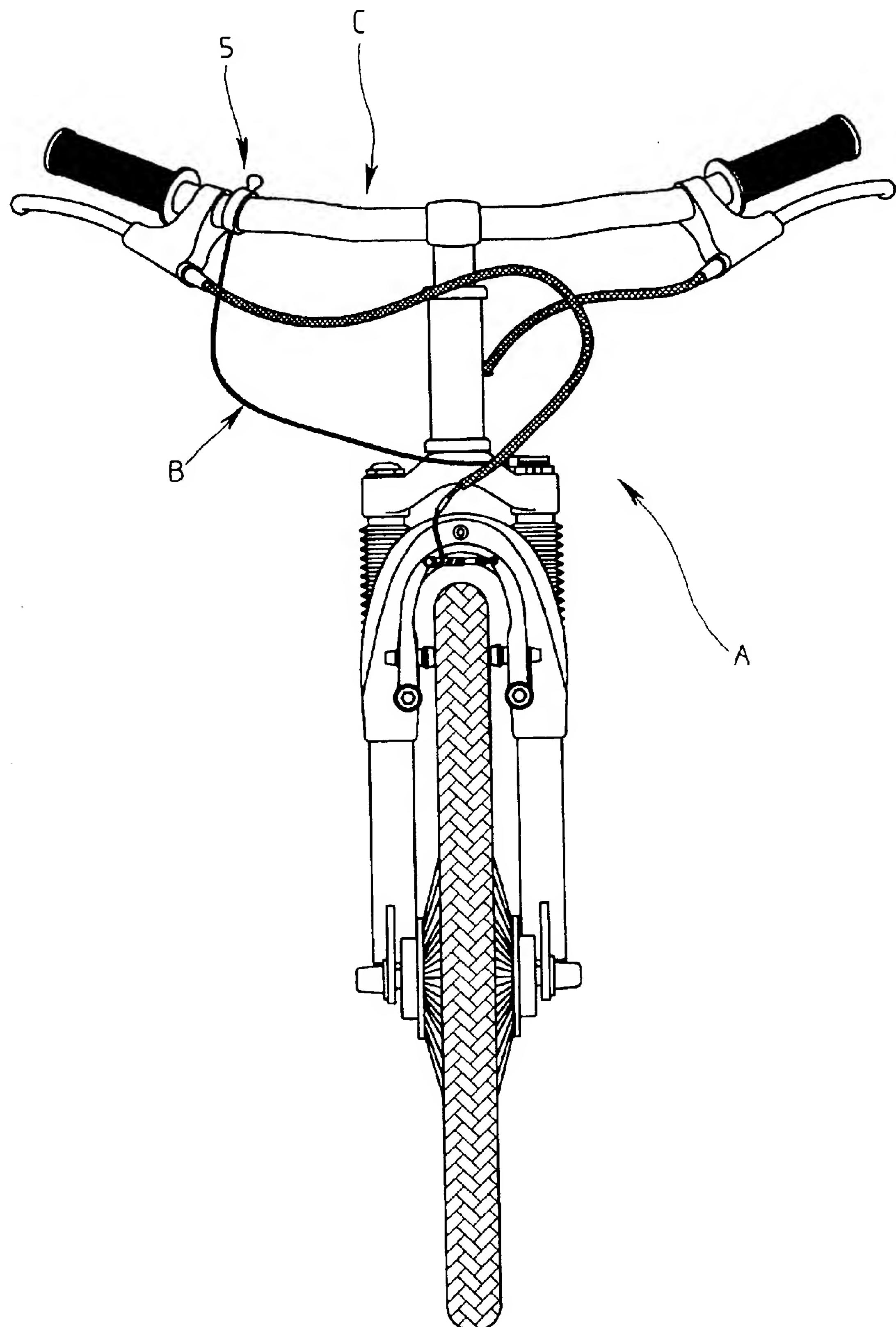


FIG.2

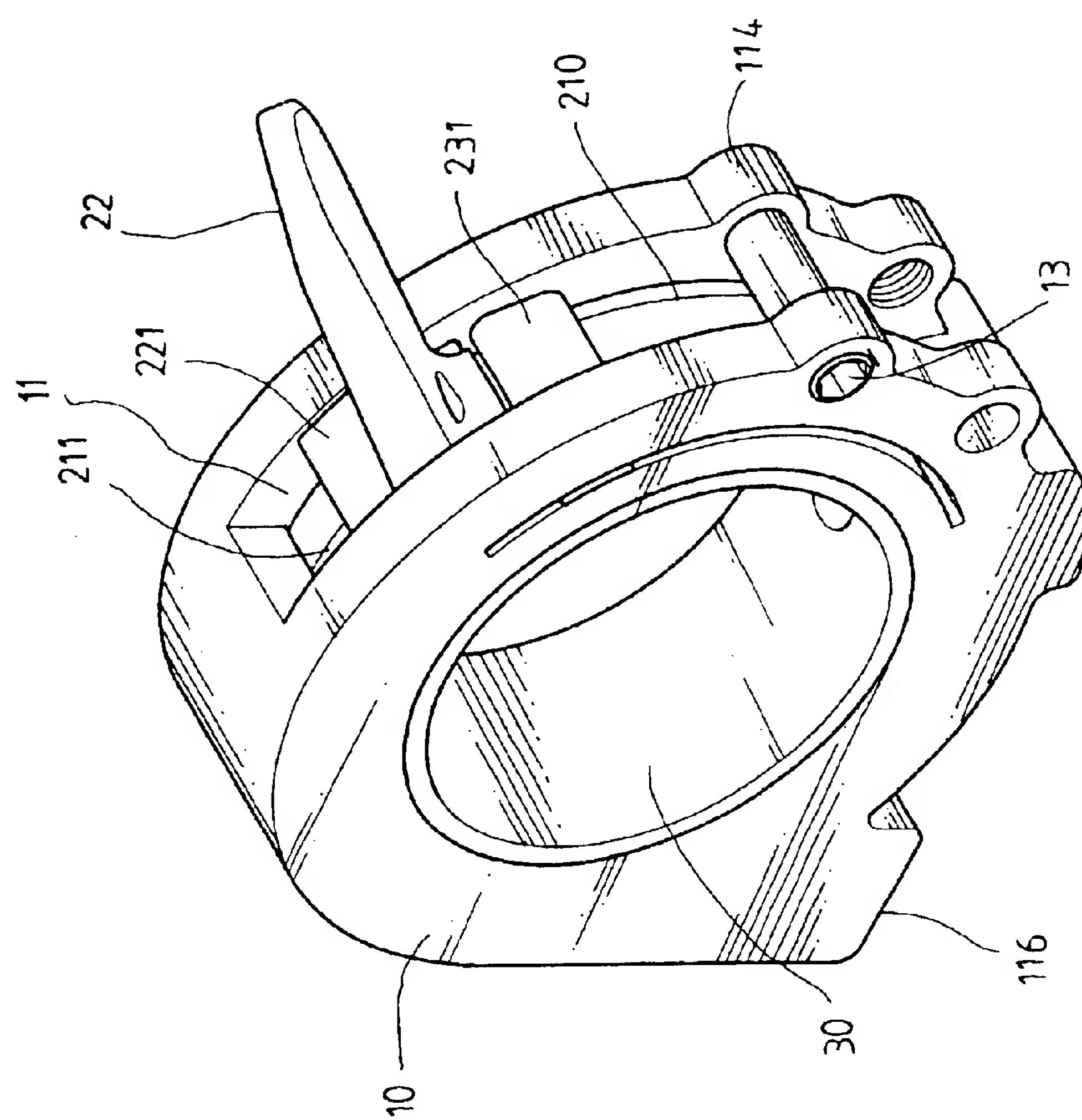


FIG. 3

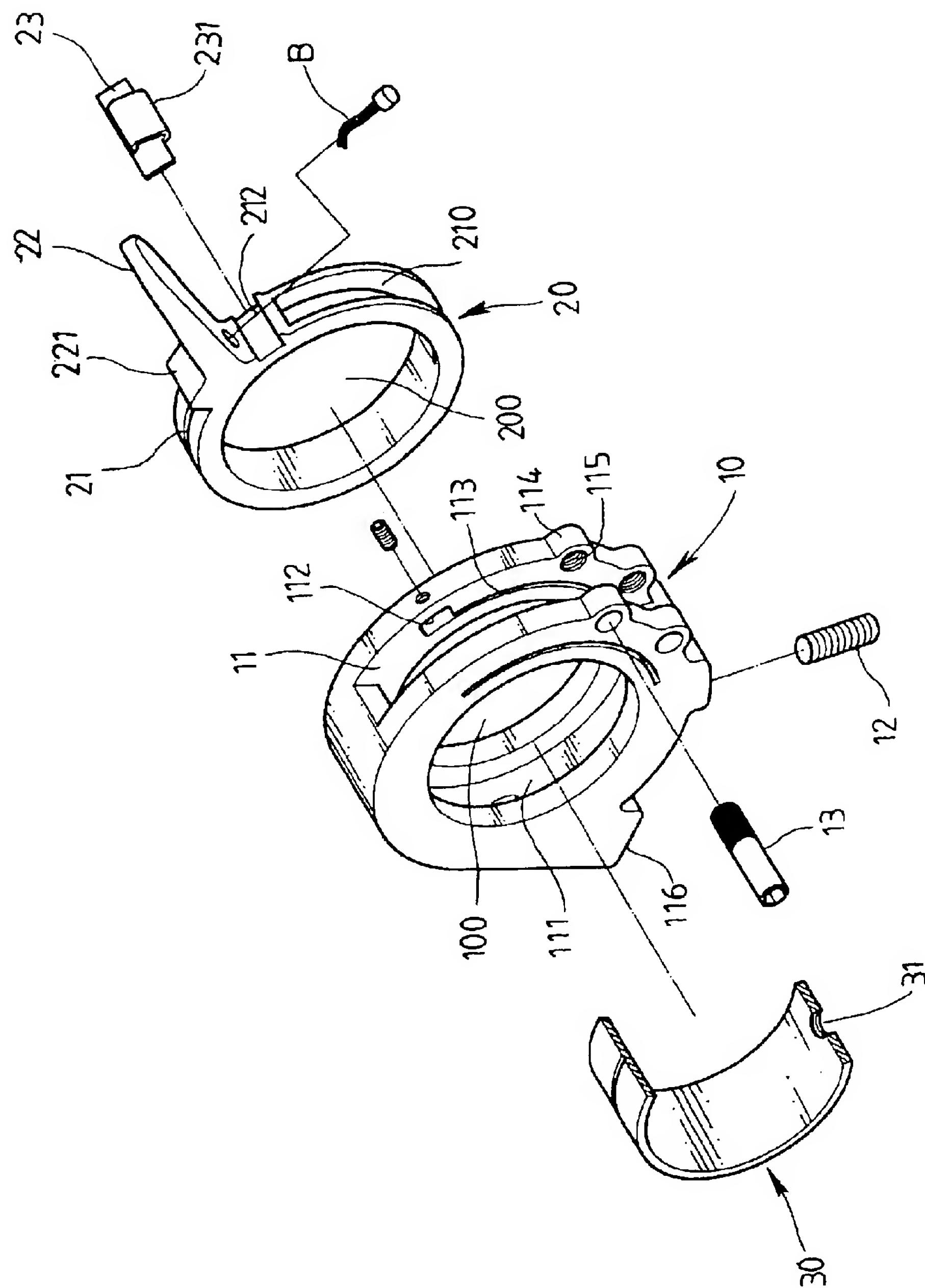


FIG.3A

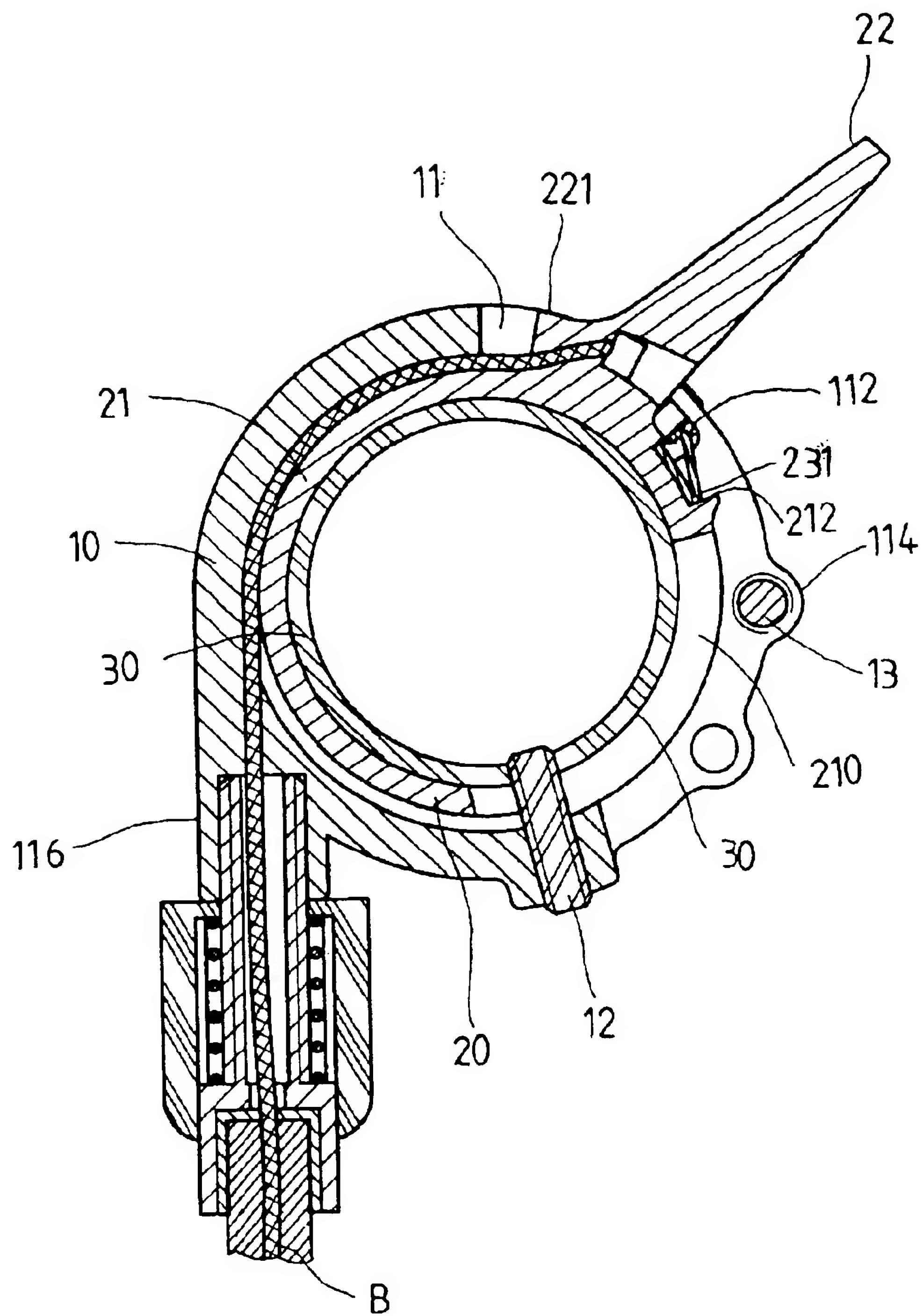


FIG.4

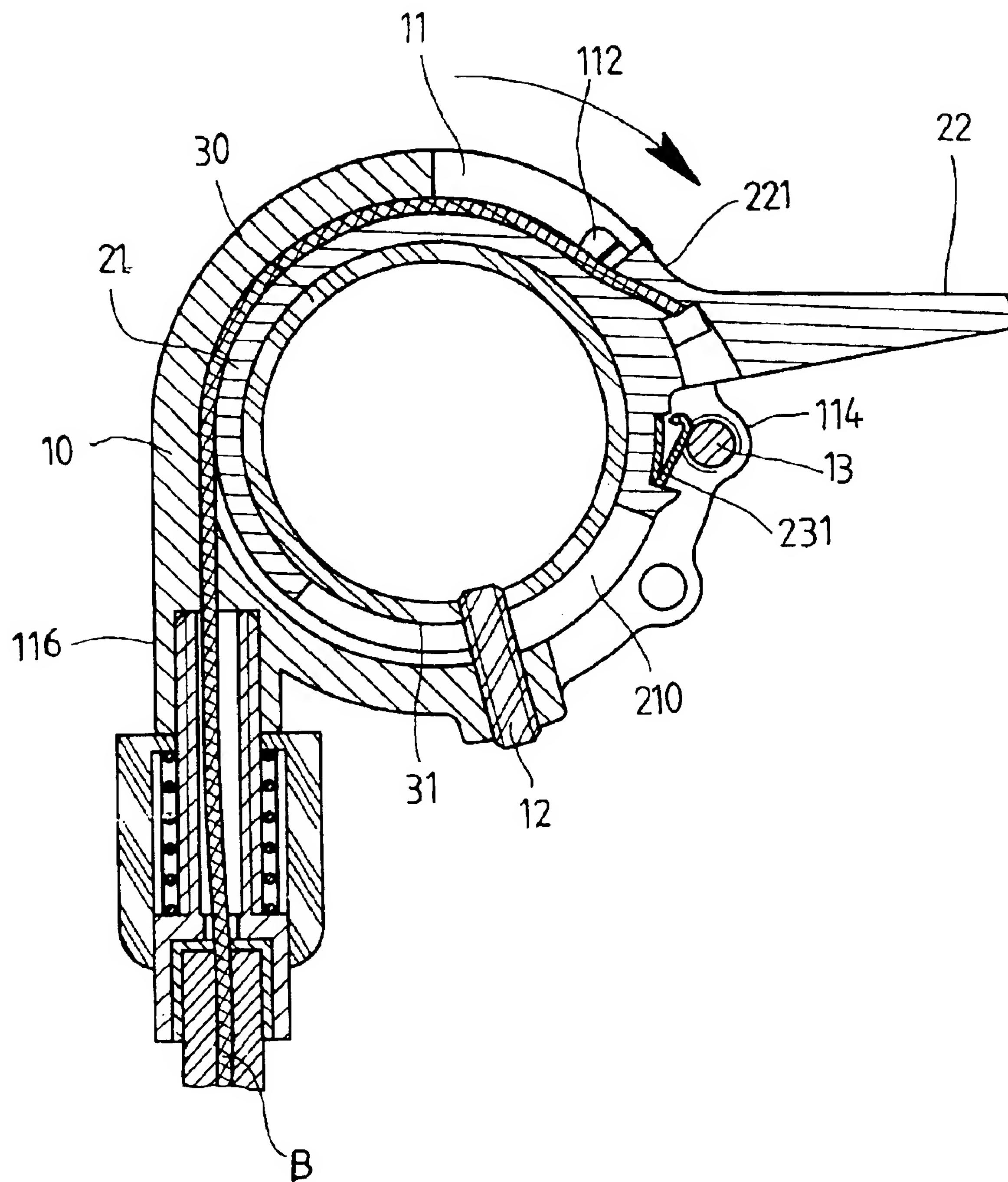


FIG. 4A

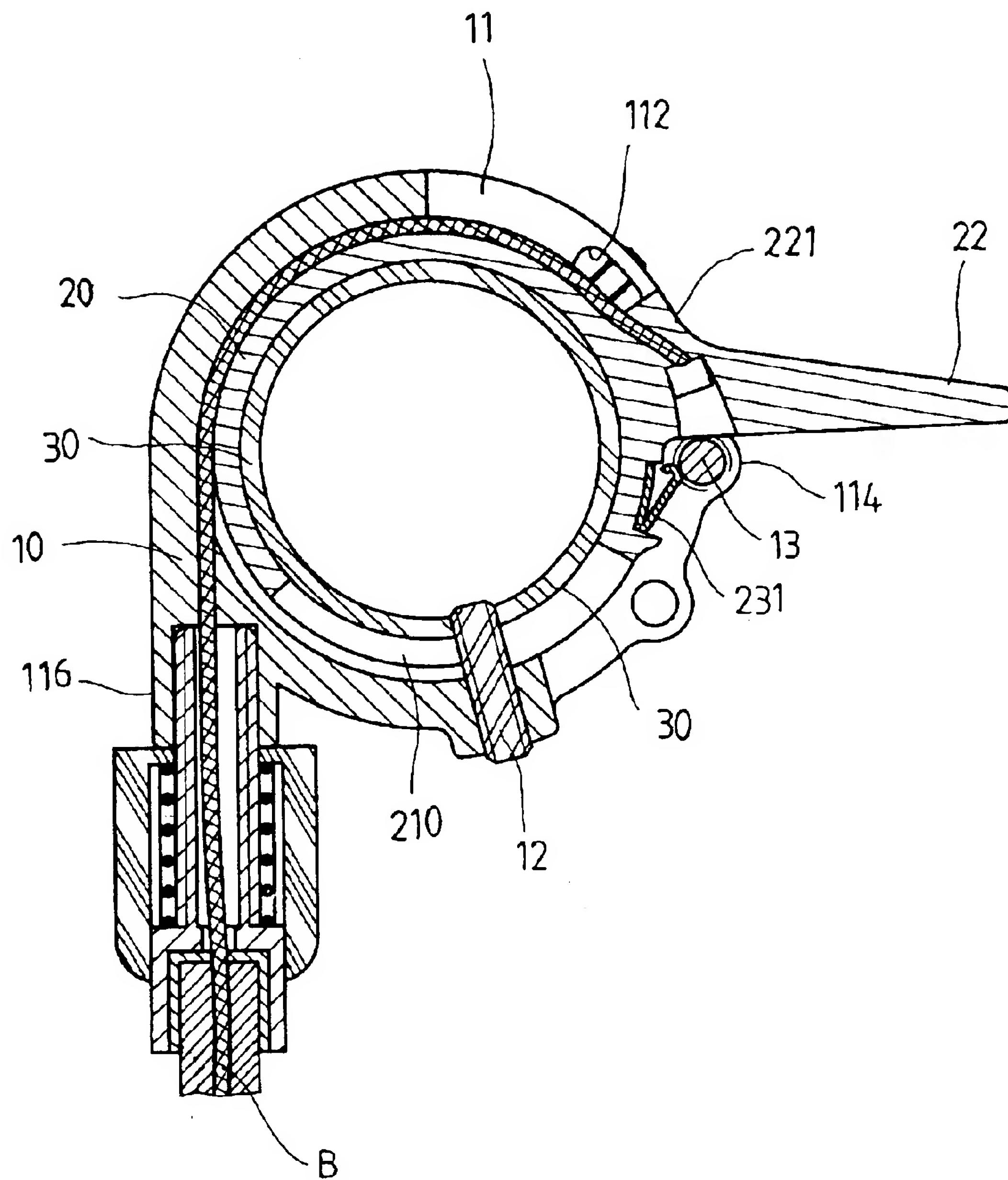


FIG.4B

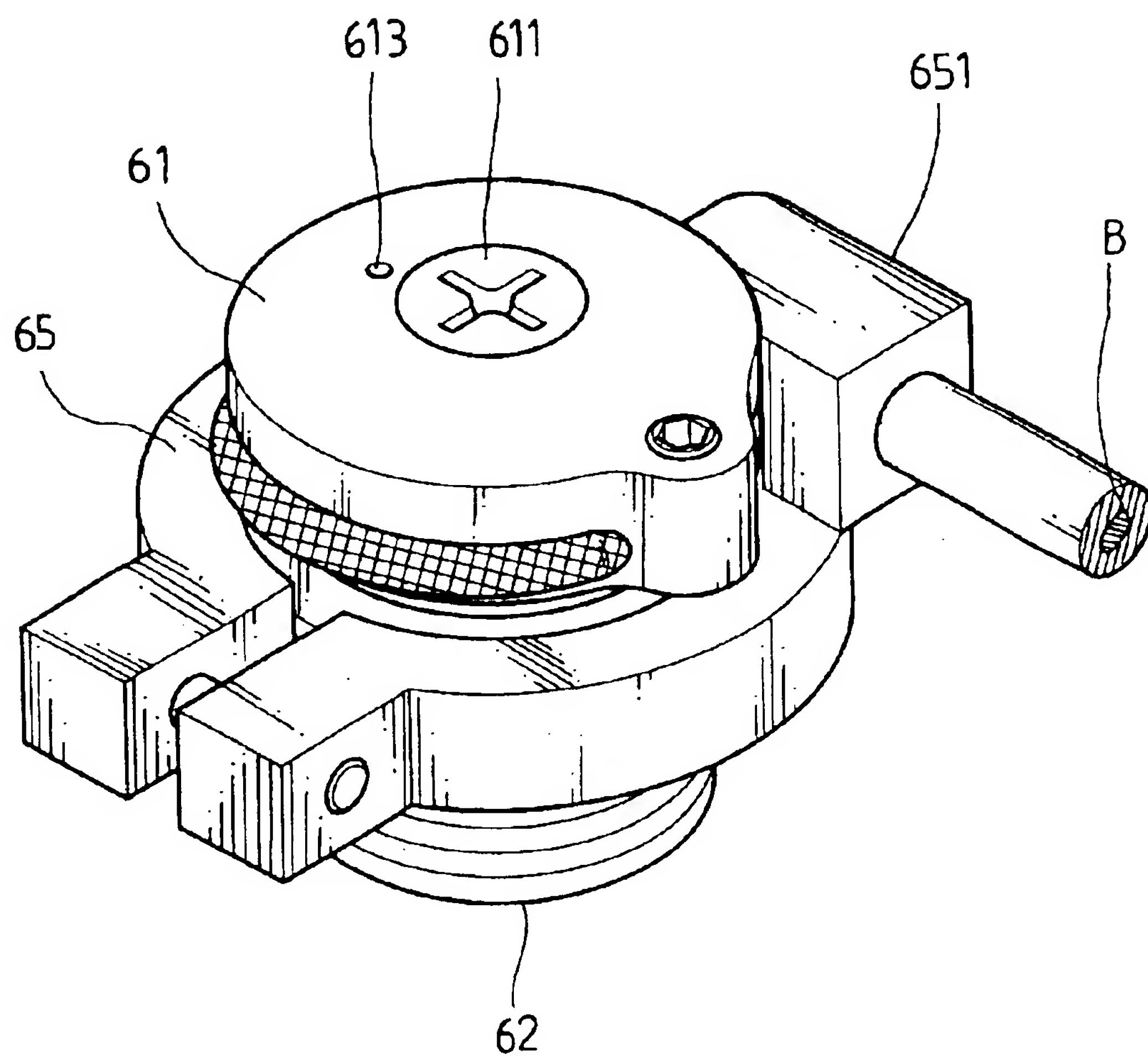


FIG.5

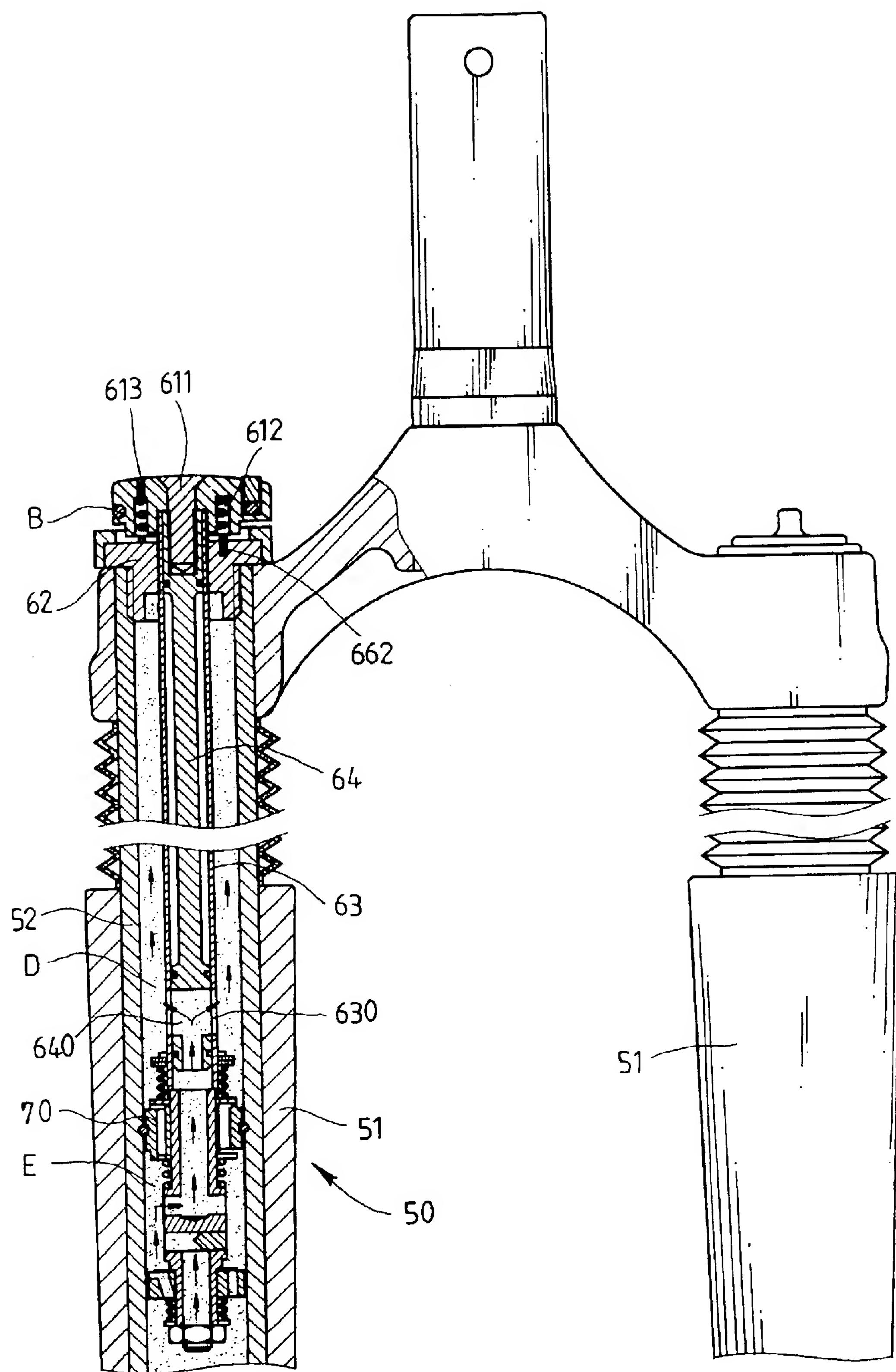


FIG. 6

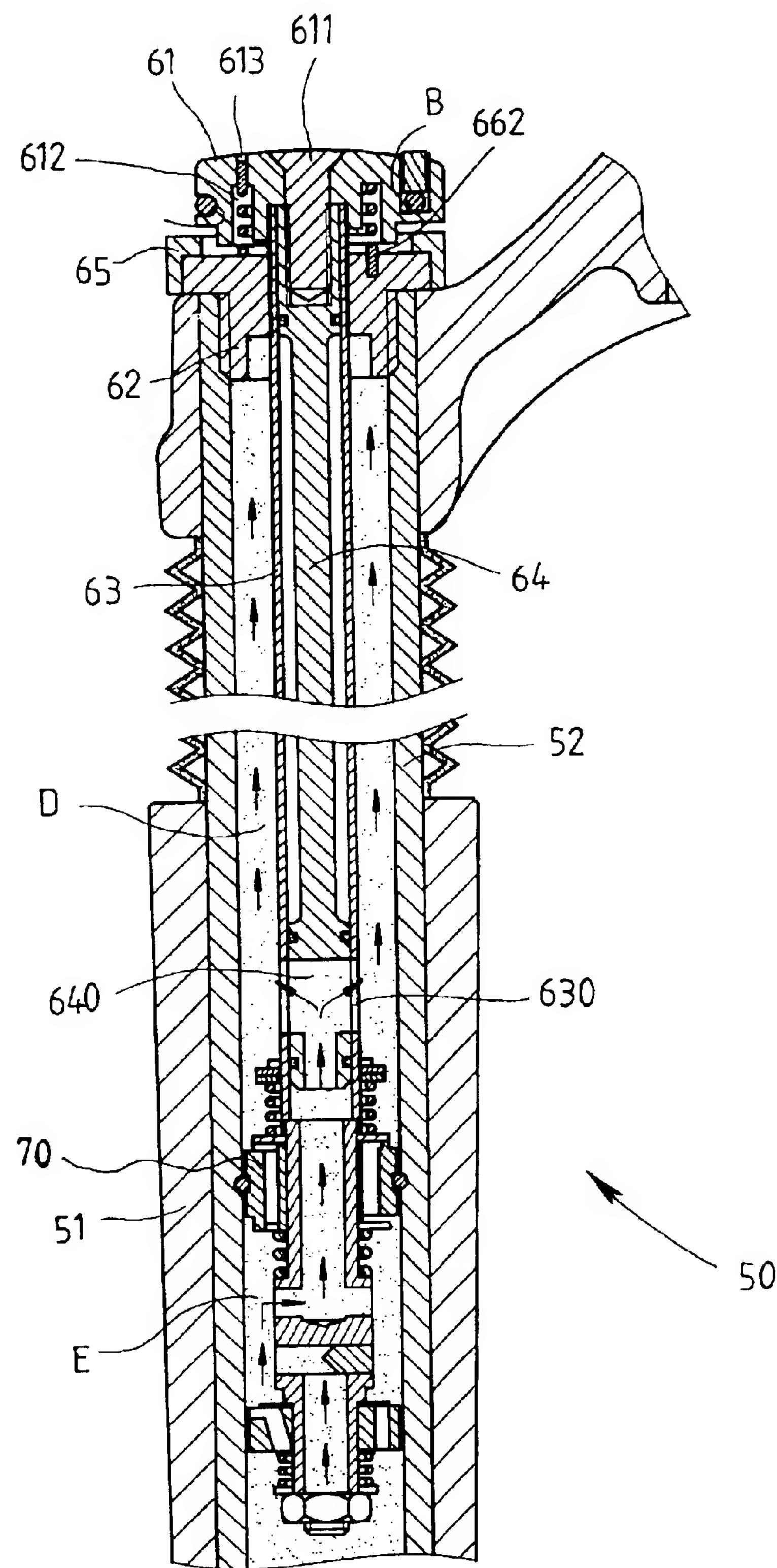


FIG.6A

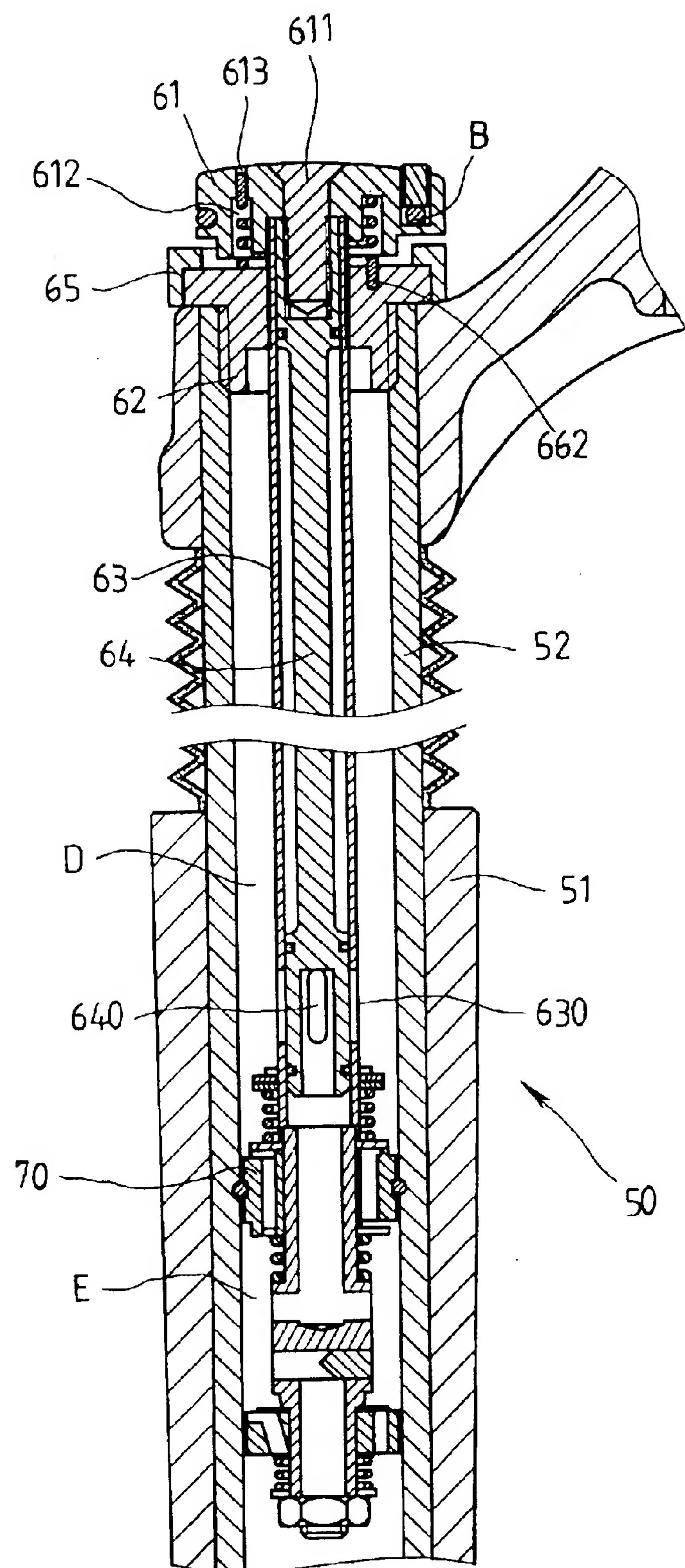


FIG. 6B

FRONT SUSPENSION SYSTEM WITH LOCK DEVICE

FIELD OF THE INVENTION

The present invention relates to a bicycle front suspension system which is controlled by a controller on the handlebar so as to limit the hydraulic fluid from flowing in communication between two chambers in the suspension system.

BACKGROUND OF THE INVENTION

A conventional bicycle front suspension device generally includes two cylinders on the front fork and each contains hydraulic fluid which flows between two chambers so as to let the inner portion be movable relative to the outer portion when a load is applied to the bicycle. The front suspension device is a popular device and provides the cyclists a comfortable riding condition regardless of the condition of roads. Nevertheless, this suspension device becomes a burden when the bicycle goes on an upward slope. Responsive to this, U.S. Pat. No. 6,217,049 discloses a lockout mechanism which allows the cyclists to lock the suspension device when the bicycle goes upward. However, the lockout mechanism is not convenient for the cyclist to operate because the adjusting pin is located at the position where the cyclist has to get off the saddle so as to access the adjusting pin.

The present invention intends to provide a bicycle front suspension device that has a controller on the handlebar so that the cyclist simply shifts a lever to lock or unlock the front suspension device.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention, there is provided a controller and a bicycle front suspension device. The controller comprises a first collar and a slot is defined radially through the first collar. A second collar is rotatably engaged in the first collar and a lever extends radially from the second collar. The lever extends through the slot and an engaging member is located on the second collar and beside the lever. A stop device is connected to the first collar and located cross over the slot.

A control cable has an end fixed to the second collar and the other end of the control cable is fixed to a cap of one of two suspension cylinders of the front suspension system. The cap is rotated between an operative position for allowing the suspension cylinder to absorb shock, and a lockout position for allowing the suspension cylinder to be locked.

The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view to show the front suspension system on a bicycle;

FIG. 2 is a front view to show the control cable is connected between the controller and the front suspension system;

FIG. 3 is a perspective view to show the two collars of the controller of the present invention;

FIG. 3A is an exploded view to show the two collars of the controller of the present invention;

FIG. 4 is a cross sectional view to show the lever is located at the operative position;

FIG. 4A is a cross sectional view to show that the lever is rotated;

FIG. 4B is a cross sectional view to show that the lever is rotated to the lockout position;

FIG. 5 is a perspective view to show the cap and the base member and the control cable is wrapped to the cap;

FIG. 6 shows the front suspension fork and one of the two cylinders is shown in cross section;

FIG. 6A is a cross sectional view to show the cylinder is in operative condition, and

FIG. 6B shows that the cap is rotated and the cylinder is in locked.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, the controller 5 as shown in FIG. 3 is connected to the handlebar "C" of the bicycle "A" and a control cable "B" is connected between the controller 5 and one of two cylinders of the front suspension fork of the present invention.

Referring to FIGS. 3, 3A and 4, the controller 5 comprises a first collar 10 having a through hole 100 and a second collar 20. A slot 11 is defined radially through the first collar 10 and two lugs 114 extend from the outside of the first collar 10. The slot 11 is located between the two lugs 114. A stop device 13 such a pin which extends through two lugs 114 on the first collar 10. The stop device 13 is located cross over the slot 11. Each of two facing insides of the slot 11 has a recess 112 defined therein and a groove 113 is in communication with the respective one of the recesses 112. A positioning groove 111 is defined in an inner periphery of the first collar 10.

A second collar 20 is rotatably engaged in the through hole 100 via the slot 11 and a lever 22 extends radially from the second collar 20. The lever 22 extends through the slot 11 and an engaging member 23 is located on the second collar 20 and beside the lever 22. A slot 210 is defined through the second collar 20 and a positioning screw 12 radially extends through the first collar 10, the slot 210 in the second collar 20 and a hole 31 in a soft ring 30 which is engaged with the through hole 200 so as to contact the handlebar "C" that extends through the through hole 200 of the second collar 20 to position the controller 5 on the handlebar "C". A positioning groove 21 is defined in an outer periphery of the second collar 20 so that an end of the control cable "B" extends from the end 116 of the first collar 10 and is engaged with the positioning grooves 111 and 21. The end of the control cable "B" is fixed to a root portion 221 of the lever 22. As shown in FIGS. 5 and 6, the other end of the control cable "B" is fixedly to a cap 61 of one of two suspension cylinders 50 of the front suspension system.

The engaging member 23 has two wings which are movably inserted in the recesses 12 and sized to be slid in the grooves 113. A spring plate 231 extends at angle from the engaging member 23.

Referring to FIGS. 5, 6 and 6A, each of the cylinders 50 of the front suspension system includes an outer tube 51 which is connected to the hub of the front wheel of the bicycle and an inner tube 52 which is movably inserted in the outer tube 51. The cap 61 is connected to a base member 62 which is threaded to a top of the inner tube 52. A positioning bolt 611 extends through a center of the cap 61 and is fixed to the base member 62 so that the cap 61 is rotatable about the positioning bolt 611. A clamp ring 65 is securely mounted to the base member 62 and the control

cable "B" extends into a block 651 on the clamp ring 65 and wraps the periphery of the cap 61, such that when the control cable "B" is pulled, the cap 61 is rotated.

A rod 64 is connected to an underside of the cap 61 and inserted in a tube 63 which is located in the inner tube 52. A separation member 70 is connected to a lower end of the tube 63 and divides an inner space of the inner tube 51 into a first chamber "D" and a second chamber "E". The separation member 70 has an open distal end and a central passage. The tube 63 has first holes 630 defined through a wall thereof and the rod 64 has second holes 640 defined radially therethrough. The first chamber "D" is in communication with the second chamber "E" by aligning the second holes 640 with the first holes 630, such that the hydraulic fluid in the second chamber "E" can be pressed to enter the first chamber "D" when the outer tube 51 is moved relative to the inner tube 52. A torsion spring 612 is connected to the underside of the cap 61 and one end of the spring 612 is positioned by a pin 613 extending from a top of the cap 61, the other end of the spring 612 is positioned to the base member 62 by another pin 662 on the base member 62. The torsion spring 612 allows the cap 61 to be rotated when the lever 22 is rotated from the lockout position as shown in FIG. 4B to the operative position as shown in FIG. 4.

Referring to FIGS. 4A and 4B, when the cyclist wants to lock the cylinder 50, he or she simply rotates the lever 22 as indicated by the arrow head. The rotation of the lever 22 pulls the control cable "B" to rotate the cap 61 and the rotation of the cap 61 rotates the rod 64 such that the holes 640 are shifted to the position as shown in FIG. 6B. The holes 640 of the rod 64 are not in alignment with the holes 630 of the tube 63 so that the hydraulic fluid in the two chambers "D" and "E" cannot communicate with each other. Therefore, the cylinder 50 is locked and cannot absorb shocks. When rotating the lever 22, the wings of the engaging member 23 are slid in the grooves 113 and when the lever 22 is positioned in its lockout position as shown in FIG. 4B, the stop device 13 is stuck between the lever 22 and a distal end of the spring plate 231. When rotating the lever 22 in opposite direction and back to its operative position, the cap 61 is rotated by the torsion spring 612 automatically.

The cyclist can easily and conveniently change the setting of the cylinders 50 without changing the pose when riding the bicycle and this feature improves the shortcomings of the conventional ones.

While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A combination of a controller and a bicycle front suspension device, comprising:

a first collar having a through hole which is adapted to be mounted on a bicycle handlebar and a slot defined radially through the first collar, a stop device connected to the first collar and positioned to cross over the slot;

a second collar rotatably engaged in the through hole and a lever extending radially from the second collar, the lever extending through the slot and an engaging member which is located on the second collar and beside the lever, and

a control cable having an end fixed to the second collar and extending between an outside of the second collar and an inside of the first collar, the other end of the control cable fixed to a cap of one of two suspension cylinders, the cap being rotated between an operative position for allowing the suspension cylinder to absorb shock, and a lockout position for allowing the suspension cylinder to be locked.

2. The combination as claimed in claim 1, wherein each of two facing insides of the slot having a recess defined therein and a groove is in communication with the respective one of the recesses, the engaging member has two wings which are movably inserted in the recesses and sized to be slid in the grooves, a spring plate extending at angle from the engaging member, the stop device being a pin which extends through two lugs on the first collar, the slot located between the two lugs, the stop device being stuck between the lever and a distal end of the spring plate when the lever is rotated to the lockout position.

3. The combination as claimed in claim 1, wherein a positioning groove is defined in an outer periphery of the second collar and the control cable is engaged with the positioning groove.

4. The combination as claimed in claim 1, wherein each of the cylinders includes an outer tube and an inner tube which is movably inserted in the outer tube, the cap having a rod connected thereto which is inserted in a tube which is located in the inner tube, a separation member connected to the tube and dividing an inner space of the inner tube into a first chamber and a second chamber, the separation member having an open distal end and a central passage, the tube having first holes defined through a wall thereof and the rod having second holes defined radially therethrough, the first chamber being in communication with the second chamber by aligning the second holes with the first holes.

5. The combination as claimed in claim 4, wherein a positioning bolt extends through a center of the cap and is fixed to a base member which is threadedly connected to the inner tube, the cap being rotatable about the positioning bolt.

6. The combination as claimed in claim 5, wherein a torsion spring is connected to the cap so that the cap is rotated when the lever is rotated to the operative position.

* * * * *